

DIELECTRIC RESONATOR, DIELECTRIC FILTER,  
DIELECTRIC DUPLEXER, AND COMMUNICATION APPARATUS  
INCORPORATING THE SAME

This is a division of application Serial No. 09/948,329, filed September 6,  
is now a U.S. Patent 6,168,061  
2001, which is hereby incorporated herein by reference.  
4

**BACKGROUND OF THE INVENTION**

**1. Field of the Invention**

The present invention relates to dielectric resonators, dielectric filters, and dielectric duplexers which have plated through holes arranged inside dielectric blocks and outer conductors formed on the outer surfaces of the dielectric blocks. In addition, the invention relates to communication apparatuses incorporating the same.

**2. Description of the Related Art**

In a conventional dielectric resonator, a plurality of plated through holes (holes having inner conductors formed on the inner surfaces thereof) are formed inside a substantially rectangular parallelepiped dielectric block having an outer conductor arranged on the outer surfaces of the dielectric block. One end of each of the plated through holes is open-circuited and the remaining end of each through hole is short-circuited.

The inner diameter of the short-circuited end of each plated through hole differs from the inner diameter of the open-circuited end thereof to form a stepped structure. With this structure, the axial length of each plated through hole is shortened. The stepped structure